

## **REMARKS**

The Office rejects claims 1-12 and objects to claim 13 in the subject application. Applicant amends claim 1. Claims 1-13 (1 independent claim and 13 total claims) remain pending in the application.

Support for the amendment may be found in the originally filed specification, claims, and figures. No new matter has been introduced by these amendments. For example, support for amended claim 1 can be found in paragraphs [0060] to [0076]] (or pages 12-15) of the subject application.

Reconsideration of this application is respectfully requested.

## **35 U.S.C. §102 REJECTIONS**

The Office rejects claims 1-3, 6, and 7 under 35 U.S.C. §102(b) as allegedly being anticipated by Verdick.<sup>1</sup> Applicant respectfully traverses the rejection.

Verdick fails to disclose "the signal processing circuit utilizes transfer function correction coefficients which may be varied to correct for individual differences among different listeners to allow each of the different listeners to more correctly recognize a virtual sound source imaged by the speakers" as recited in claim 1 (and claims 2, 3, 6, and 7, which variously depend from claim 1).

Verdick discloses a head mounted speaker assembly 80 attached to a multi-channel processor 70.<sup>2</sup> Verdick focuses on providing a surround sound atmosphere with as few speakers as possible in a room.<sup>3</sup> The Verdick system provides discreet sound positioning for side and height localization to approximate realistic situations.<sup>4</sup> But processor 70 in Verdick does not utilize "transfer function correction coefficients which may be varied to correct for individual differences among different listeners to allow each of the different listeners to more correctly recognize a virtual sound source imaged by the speakers" as recited in claim 1.

Thus, claims 1-3, 6, and 7 are patentable over Verdick.

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<sup>1</sup> U.S. Patent No. 5,684,879, issued November 4, 1997.

<sup>2</sup> Verdick, column 3, lines 55-59.

<sup>3</sup> Verdick, column 2, lines 10-15.

<sup>4</sup> Verdick, column 2, lines 50-56.

### **35 U.S.C. § 103 REJECTIONS**

#### **Verdick and Yoshimura References**

The Office rejects claims 4 and 5 under 35 U.S.C. §103(a) as allegedly being unpatentable over Verdick in view of Yoshimura<sup>5</sup>. Applicant respectfully traverses the rejection.

With reference to the foregoing discussion in connection with claim 1 and the Verdick reference, claims 4 and 5 (which depend from claim 1) are also patentable over Verdick in view of Yoshimura.

Yoshimura discloses a four-channel headphone subsystem, where front and rear driver units should be separated as far away as possible (so that only high-pitched tones can be sensed). A woofer 3 is located in the center, driver units 4 and 5 are located in front of and behind woofer 3, and walls 7 and 8 are located between woofer 3 and units 4 and 5. This location of elements in Yoshimura prevents the mixing of front and rear medium to high range tones until they reach the listener's ear canal.<sup>6</sup>

But Verdick in view of Yoshimura fails to teach, advise, or suggest "the signal processing circuit outputs...acoustic signals having a frequency of a prescribed frequency  $f_i$  or lower to the first and second speakers, and outputs acoustic signals having a frequency of the prescribed frequency  $f_i$  or higher to the third and fourth speakers" as recited in claim 4. Verdick in view of Yoshimura also fails to teach, advise, or suggest "the signal processing circuit outputs...acoustic signals having a frequency of a prescribed frequency  $f_i$  or higher to the first and second speakers, and outputs acoustic signals having a frequency of the prescribed frequency  $f_i$  or lower to the third and fourth speakers" as recited in claim 5.

Yoshimura separates units 4 and 5, so that only high-pitched tones can be sensed. The physical location of woofer 3, units 4 and 5, and walls 7 and 8 prevent the mixing of front and rear medium to high range tones until they reach the listener's ear canal. But these features in Yoshimura do not disclose a signal processor outputting acoustic signals having the prescribed frequencies to the speakers as recited in claims 4 and 5.

Thus, claims 4 and 5 are patentable over Verdick in view of Yoshimura.

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<sup>5</sup> U.S. Patent No. 3,984,885, issued October 12, 1976.

### **Verdick and Nagayoshi References**

The Office rejects claims 8 and 9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Verdick in view of Nagayoshi<sup>7</sup>. Applicant respectfully traverses the rejection.

With reference to the foregoing discussion in connection with claim 1 and the Verdick reference, claims 8 and 9 (which variously depend from claim 1) are also patentable over Verdick in view of Nagayoshi.

Nagayoshi discloses a headphone 10 with a vibration generating unit 14 (to be placed on the back of the neck of a user). Unit 14 provides vibrations to the back part of the neck (simultaneously with acoustic sound from sound generating units 16).<sup>8</sup>

But Verdick in view of Nagayoshi fails to teach, advise, or suggest “the headphone further includes a low frequency-dedicated speaker for reproducing only audio signals in a low frequency band” as recited in claim 8. Unit 14 in Nagayoshi provides vibrations and unit 16 in Nagayoshi provides acoustic sound. However, neither include a low frequency-dedicated speaker for reproducing only audio signals in a low frequency band.

Verdick in view of Nagayoshi also fails to teach, advise, or suggest “the low frequency-dedicated speaker is located in the vicinity of a rear part of the head of the listener, when the headphone is worn” as recited in claim 9. Unit 16 provides acoustic sound, but unit 16 is not located in the vicinity of a rear part of the head of the listener, when the headphone is worn.

Thus, claims 8 and 9 are patentable over Verdick in view of Yoshimura.

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<sup>6</sup> Yoshimura, column 2, lines 39-56).

<sup>7</sup> U.S. Patent No. 6,603,863, issued August 5, 2003.

<sup>8</sup> Nagayoshi, Abstract and column 8, lines 57-65.

### **Verdick, Nagayoshi, and Lensing References**

The Office rejects claim 10 under 35 U.S.C. §103(a) as allegedly being unpatentable over Verdick in view of Nagayoshi as applied to claim 8 and further in view of Lensing<sup>9</sup>. Applicant respectfully traverses the rejection.

With reference to the foregoing discussions in connection with claim 1 and the Verdick reference and claim 8 and the Nagayoshi reference, claim 10 (which variously depends from claims 1 and 8) is also patentable over Verdick in view of Nagayoshi and Lensing.

The Office relies on the abstract and a figure of the Lensing reference for this Office Action. Applicant submits that 37 C.F.R. § 1.2 requires that all "business with the Patent and Trademark Office should be transacted in writing" and that "the action of the Patent and Trademark Office will be based exclusively on the written record in the Office". Accordingly, because the Lensing reference is not in English and not part of the written record, this Response is based solely on the Verdick and Nagayoshi references. If the Office wishes to rely on the Lensing reference or other non-English aspects, Applicant requests re-issuance of a non-final office action including an English translation of the Lensing reference as part of the written record. Applicant respectfully traverses the rejection.

### **Verdick and Papiernik References**

The Office rejects claim 11 under 35 U.S.C. §103(a) as allegedly being unpatentable over Verdick in view of Papiernik<sup>10</sup>. Applicant respectfully traverses the rejection.

With reference to the foregoing discussion in connection with claim 1 and the Verdick reference, claim 11 (which depends from claim 1) is also patentable over Verdick in view of Papiernik.

Papiernik discloses vibrational audio output discs positioned adjacent to the temples of the user to provide an enhanced acoustical effect.<sup>11</sup> But Verdick in view of Papiernik fails to teach, advise, or suggest "a vibration unit for vibrating based on a

<sup>9</sup> DE 26 08 908, September 8, 1977.

<sup>10</sup> U.S. Patent No. 4,821,323, issued April 11, 1989.

<sup>11</sup> Papiernik, column 2, lines 33-37.

dedicated low frequency band signal used for reproducing only audio signals in a low frequency band" as recited in claim 11.

Thus, claim 11 is patentable over Verdick in view of Papiernik.

#### **Verdick and Inanaga References**

The Office rejects claim 12 under 35 U.S.C. §103(a) as allegedly being unpatentable over Verdick in view of Inanaga<sup>12</sup>. Applicant respectfully traverses the rejection.

With reference to the foregoing discussion in connection with claim 1 and the Verdick reference, claim 12 (which depends from claim 1) is also patentable over Verdick in view of Inanaga.

Inanaga discloses a headphone unit 142 that can be adjusted to rotate at an arbitrary angle relative to a headband 141 of a headphone 140.<sup>13</sup> But Verdick in view of Inanaga fails to teach, advise, or suggest "the support includes a first supporting member for supporting the first and third speakers and a second supporting member for supporting the second and fourth speakers" as recited in claim 11.

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<sup>12</sup> U.S. Patent No. 5,761,314, issued June 2, 1998.

<sup>13</sup> Inanaga, column 29, lines 24-27.

### CONCLUSION

Thus, the Applicant respectfully submits that the present application is in condition for allowance. Reconsideration of the application is thus requested. Applicant invites the Office to telephone the undersigned if he or she has any questions whatsoever regarding this Response or the present application in general.

Respectfully submitted,

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